MicroSat-1 (PharmaSat)

Ames Research Center

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Engineering Team: NASA ARC, ASRC, Jacobs, UARC

Objectives:

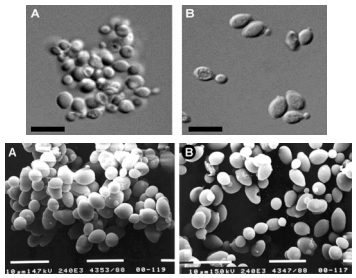
- A PI led investigation to characterize the effect of microgravity upon yeast susceptibility to antifungal drugs for countermeasure development
- "Proof-of-Concept" demonstrating the use of a MicroSat development in order to achieve peer reviewed research

Relevance/Impact:

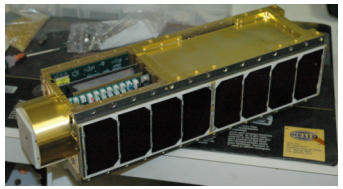
- Directly addresses questions concerning how the space flight environment alters yeast resistance to the azole antifungal agent voriconazole; microgravity and modeled microgravity data suggest that resistance to azoles is increased
- Important implications for the prevention and management of fungal infections that may occur during space exploration
- Provides an alternative method to conduct space based life science studies.

Development Approach:

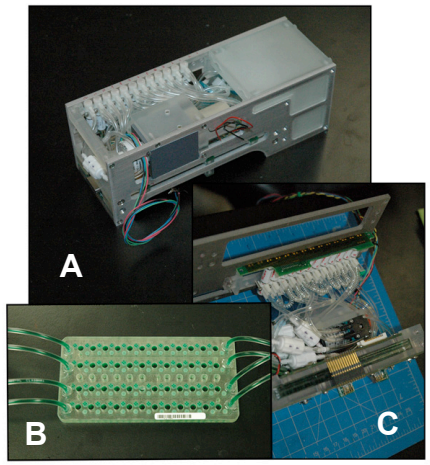
- Experimental design is based upon an internationally recognized *in vitro* laboratory testing method
- Statistical analysis of the *in situ* data will be based upon the methods used to analyze longitudinal data
- PharmaSat vehicle design and management leverages upon the extensive technology development program and recent flight heritage of GeneSat-1



Saccharomyces cerevisiae **grown at 25ºC, 72h. Panel A HARV, panel B gravity control. Bars are 10mm.**



PharmaSat Flight Article



A -PharmaSat Payload, B-Fluidics Card, C - Fluid Delivery System

Project Life Cycle Schedule

Milestones	PDR	CDR	FRR	Launch	Ops	Final Report
Actual/ Baseline	2/07	4/07	4/08	6/08	6/08 - 9/08	Return + 12m

Resource Requirements/Mission Overview

Total Mass (Satellite + PPOD)	7.6 kg (5.1+ 2.5 kg)
Satellite Power (on-orbit average)	4 - 5 W
Satellite Volume	3 "Cubes" (14" x 4" x 4") incl beacon
Science Data/Command Up/Downlink E/PO Beacon/Data Downlink	~200 kB/day, ISM band (2.4 GHz) Amateur band (~437 MHz)
Launch Readiness Date	NET 6/2008
Mission Duration (spacecraft design life);	≥ 21 days (Experiment Duration ~ 100 hours)
Orbit Altitude	460 km
Orbit Inclination	40.5°
Launch Vehicle	Minotaur I (TacSat-3 Primary)

Revision Date:10/01/07